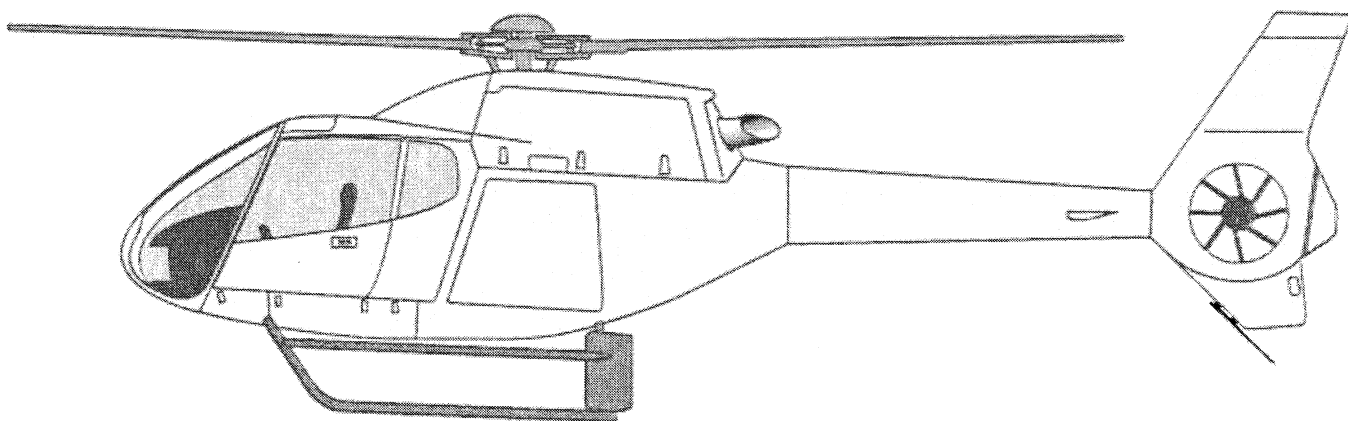


HEATER SERVICE MANUAL EC120H-100M-1

**AIR COMM CORPORATION
3300 AIRPORT ROAD
BOULDER, CO. 80301**

**INSTRUCTIONS FOR CONTINUED AIRWORTHINESS
EUROCOPTER EC120B
HEATING SYSTEM**



Revision 0

11, February 2004

LIST OF EFFECTIVE PAGES

LIST OF REVISIONS Revision 0 (Original Issue).....February 11, 2004

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| Record of Revisions | i | 0 |
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CHAPTER 0 INTRODUCTION

1. SCOPE

The scope of this manual encompasses the scheduled and unscheduled maintenance procedures for the continued airworthiness of the Air Comm Corporation heater system installed in the Eurocopter EC120B series helicopter.

2. PURPOSE

The purpose of this manual is to provide the aircraft mechanic in the field the necessary information to maintain the heater system.

3. ARRANGEMENT

This manual is arranged by chapters which are broken down into paragraphs and subparagraphs. All of the chapters and paragraphs are listed in the front of this manual in the Table of Contents, and are further identified by their individual page number.

4. APPLICABILITY

This manual is applicable to Eurocopter Helicopter models EC120B that are equipped with the Air Comm Corporation kit number EC120H-200 heater system.

5. DEFINITIONS

The following terms are provided to give a ready reference to the meaning of some of the words contained within this manual. These definitions may differ from those given by a standard dictionary.

Ambient air temperature: The temperature of the air surrounding a person or object.

6. ABBREVIATIONS

| | |
|--------------|--------------------------------|
| Lbs: | Pounds |
| oz: | Ounces |
| Psig: | Pounds Per Square Inch (gauge) |
| gr: | Grams |
| kg: | Kilograms |
| mm: | Millimeters |
| Nm: | Newton-meters |

Chapter 0
INTRODUCTION (continued)

7. PRECAUTIONS

The following precautions are found throughout this manual, and will vary depending on the seriousness of the Hazard or Condition:

WARNING: May be a maintenance procedure, practice, condition, etc., which could result in personal injury or loss of life.

CAUTION: May be a maintenance procedure, practice, condition, etc., which could result in damage or destruction of equipment.

NOTE: May be a maintenance procedure, practice, condition, etc., or a statement which needs to be highlighted.

8. UNITS OF MEASUREMENT

All measurements contained within this manual are given in the United States standard measurement, followed by the metric conversion in parentheses.

9. INFORMATION ESSENTIAL TO THE CONTINUED AIRWORTHINESS OF THE HEATER SYSTEM.

This manual provides information which is required for operation and maintenance of the Air Comm Heater system installed in the Eurocopter model EC120B series helicopter. After completion of the heater installation this document must be placed with the appropriate existing aircraft documents.

10. REFERENCE DOCUMENTS

The approval basis of the system covered by this ICA is Supplemental Type Certificate **SR00549DE**

11. DISTRIBUTION

This document is to be placed with the aircraft maintenance records at the time of system installation.

Changes will be made to this document in response to "Safety of Flight", and or "Non-safety of Flight" issues. Any changes will result in a revision to this document. Revisions shall be noted in the Record of Revisions (page i), and on the List of Revisions (page ii) of this manual.

In addition to the revision of the manual, those changes categorized as "Safety of Flight" shall have a Service Bulletin issued to the operator providing the necessary information to comply with, and or to correct, the "Safety of Flight" issue.

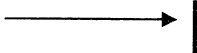
Replacement, and or revised copies of this manual maybe purchased by contacting:

Air Comm Corporation Service Department
3300 Airport Road
Boulder, CO.80301
Phone No. 303-440-4075 Fax No. 303-440-6355

Chapter 0
INTRODUCTION (continued)

12. CHANGES TO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

Changes made to a line or paragraph of this document will be indicated by a vertical bar in the right hand margin, while a complete page change will be indicated by a vertical bar next to the page number.

(Example: Any change will appear with a vertical bar next to that change). 

13. HEATER FEATURES

The EC120 B Heater System features the following items, Two Forward Heater Ejectors (Cockpit), One Aft Heater Ejector (Cabin), Two Windshield Defroster Vanes, One Heater / Defroster Control Valve Assembly.

14. DESCRIPTION OF THE HEATER AND ITS INSTALLATION

This cabin heater system is a bleed air type, which incorporates the ACC mini ejector concept.

The heater plumbing extends from the existing engine bleed port located on the aft R/H Engine Firewall. The Bleed port is a Tee Fitting, of which the top fitting is used to connect to the bleed air plumbing to the ACC heater system.

The bleed air plumbing extends forward across the transmission deck, then down along the back of the passenger Cabin, and again forward & inboard to the Heater / Defroster Control Valve Assembly. It then branches out to the forward & aft heater ejectors, and the defroster vanes.

The Heater / Defroster Control valve is located between the Pilot & Co-Pilots seats, and just aft of the center pedestal. This valve manually controls the flow of bleed air to two forward ejectors (cockpit), the aft ejector (Cabin, Aircraft Right), as well as the windshield defrosters.

The heater ejectors and defroster vanes mix engine bleed air with cabin air which exhausts warm air from the ejector outlets along the floor of the aircraft, and up the windshield via the defroster vane assemblies.

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**CHAPTER 1
AIRWORTHINESS LIMITATION SECTION**

1. Airworthiness Limitations

“No airworthiness limitations associated with this type design change”

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CHAPTER 2 INSPECTIONS

1. INSPECTION REQUIREMENTS

PERIODIC INSPECTIONS (Hours are aircraft time)

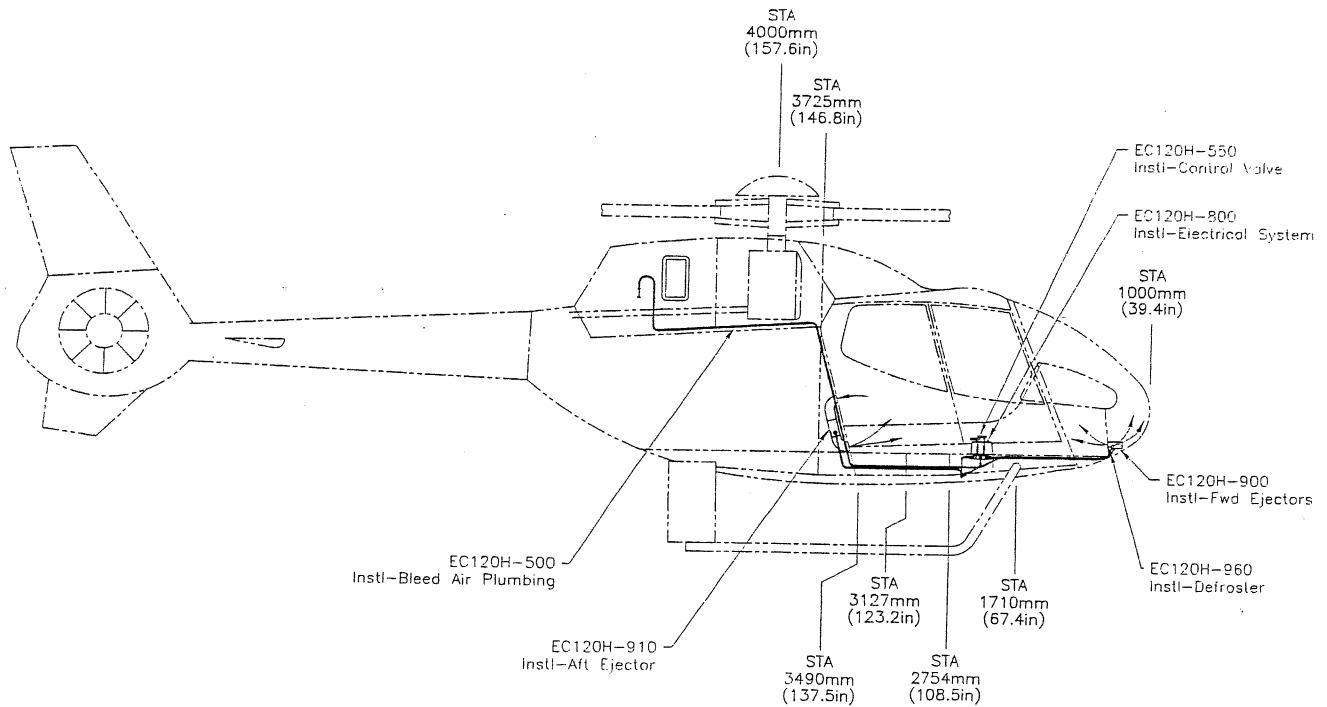
| Item | Annually Prior to Heating Season | Special Inspection Information | Ref. Figure |
|----------------------|--|--|-------------|
| Heater Control Valve | X | Check for operation and security. Check placard installation for security. | 3.3 |
| Bleed Air Plumbing | X | Check for security and evidence of air leaks around fittings. | 3.2 |
| Heater Ejectors | X | Check for security and evidence of air leaks around fittings. | 3.4 & 3.5 |
| Defroster Vanes | X | Check for security and evidence of air leaks around fittings. | 3.6 |
| Placards & Markings | X | Check for security and legibility | 4.1 |

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CHAPTER 3
LOCATION AND ACCESS

1. LOCATION OF HEATER FEATURES

| Nomenclature | Figure | Description of Location |
|---|--------|--|
| Cabin Heater General Arrangement | 3.1 | Reference only. |
| Bleed Air Plumbing Routing | 3.2 | Reference only. |
| Heater / Defroster Control Valve Installation | 3.3 | Located between Pilots and Co-pilots Seats. |
| Forward Heater Ejectors | 3.4 | Located just forward of the tail rotor control pedals. |
| Aft Heater Ejector | 3.5 | Located out board on aircraft left just below the passenger seat. |
| Defroster Vanes | 3.6 | Located level with the cabin floor, just forward of the tail rotor control pedals. |

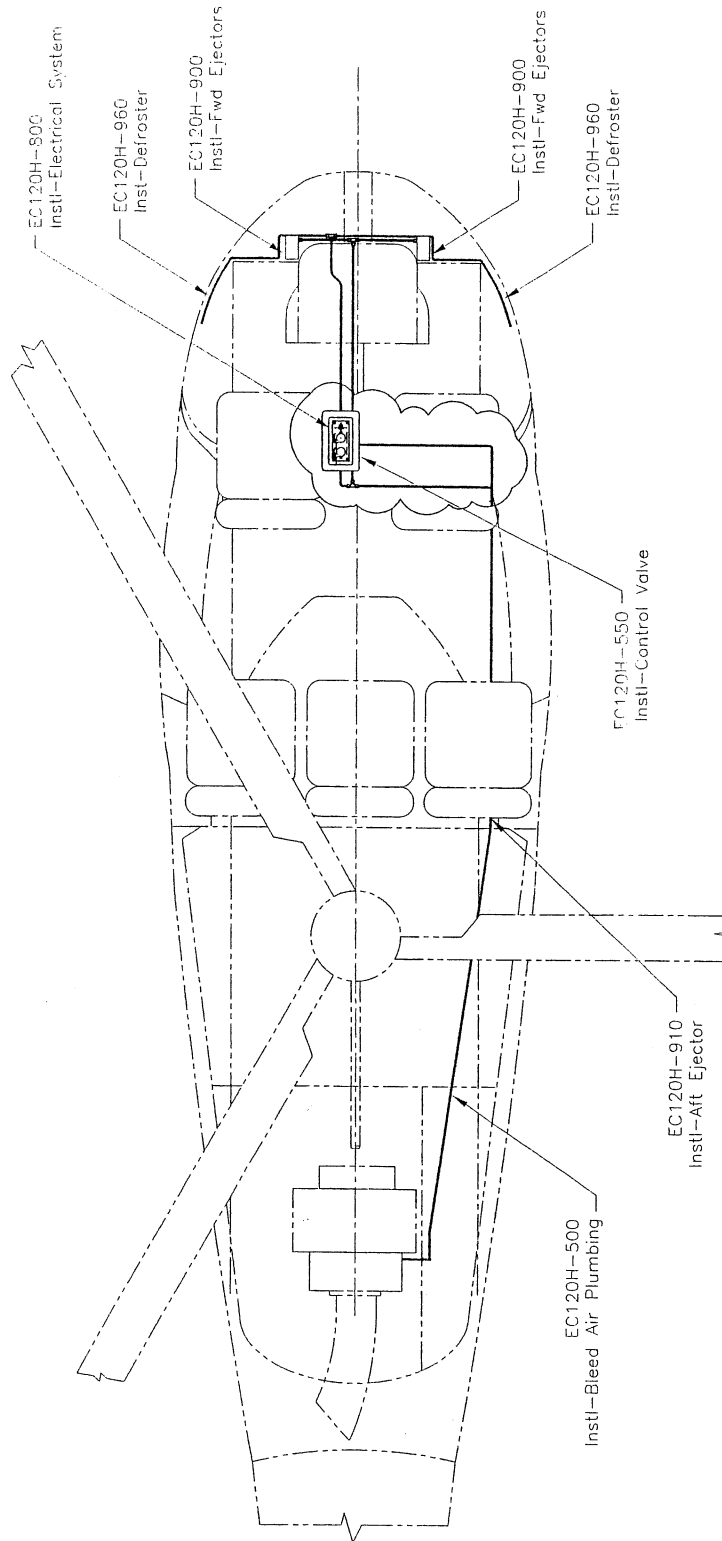


SIDE VIEW

Fig. 3.1 Layout of Eurocopter EC120B Heater System
(continued)

Chapter 3
LOCATION AND ACCESS (continued)

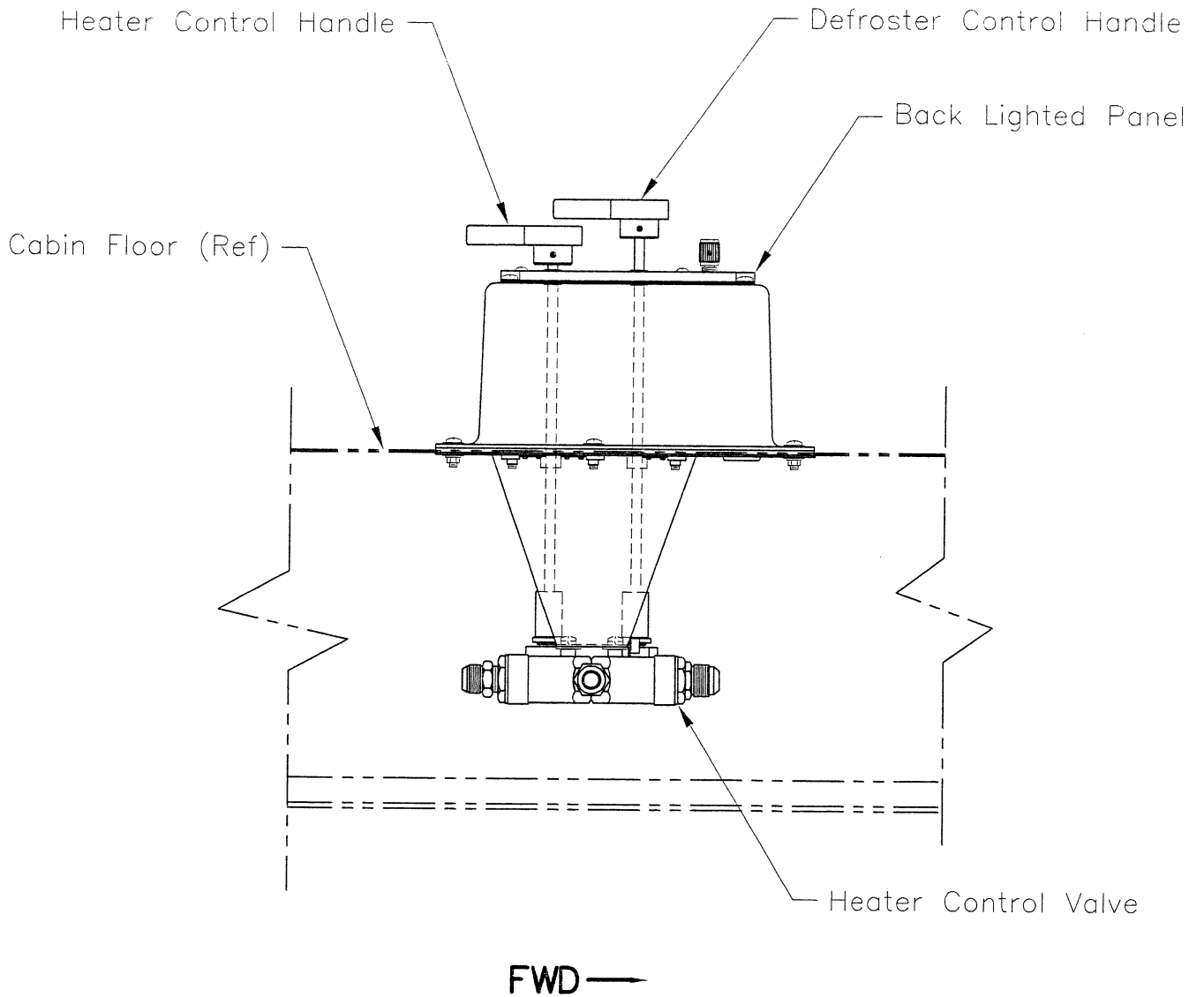
2. LAYOUT OF HEATER SYSTEM (CONTINUED).



TOP VIEW

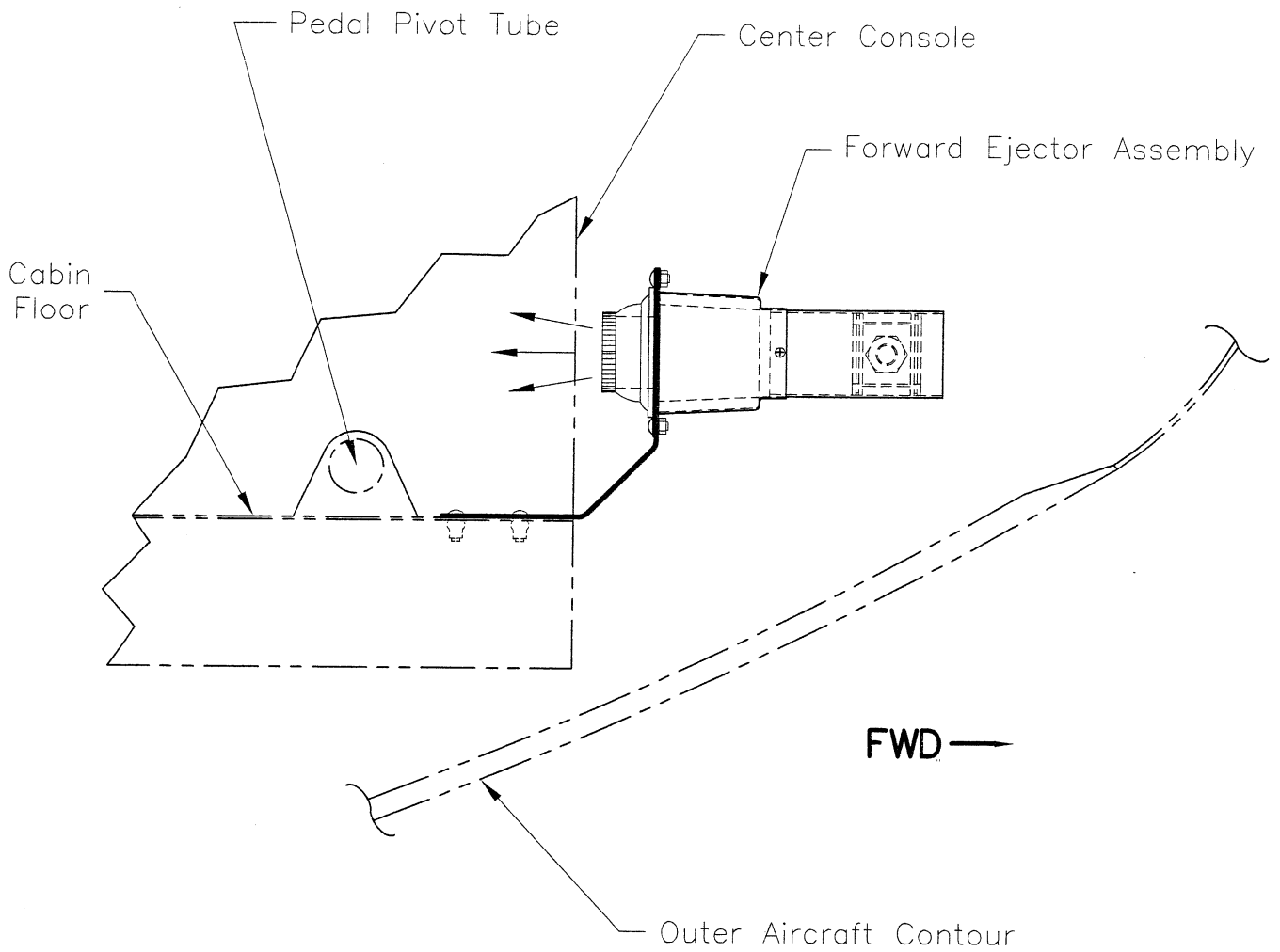
Fig. 3.2 Top View – Model EC120B Fuselage / Plumbing Routing
(Continued)

Chapter 3
LOCATION AND ACCESS (continued)



VIEW LOOKING INBOARD AIRCRAFT RIGHT
Fig. 3.3 Heater / Defroster Control Valve Installation

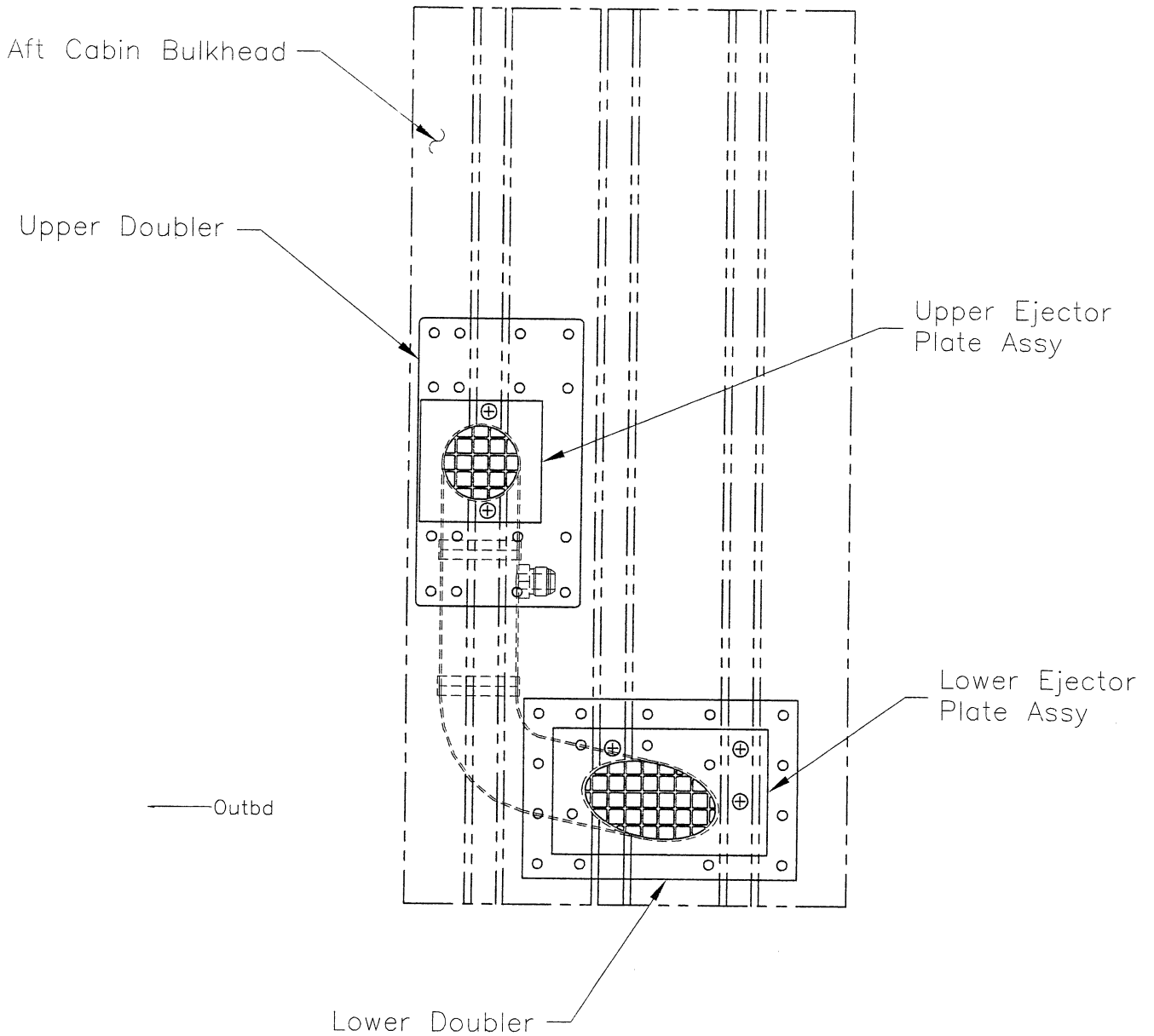
Chapter 3
LOCATION AND ACCESS (continued)



VIEW LOOKING INBOARD AIRCRAFT RIGHT (typical both sides)

Fig. 3.4 Forward Heater Ejectors

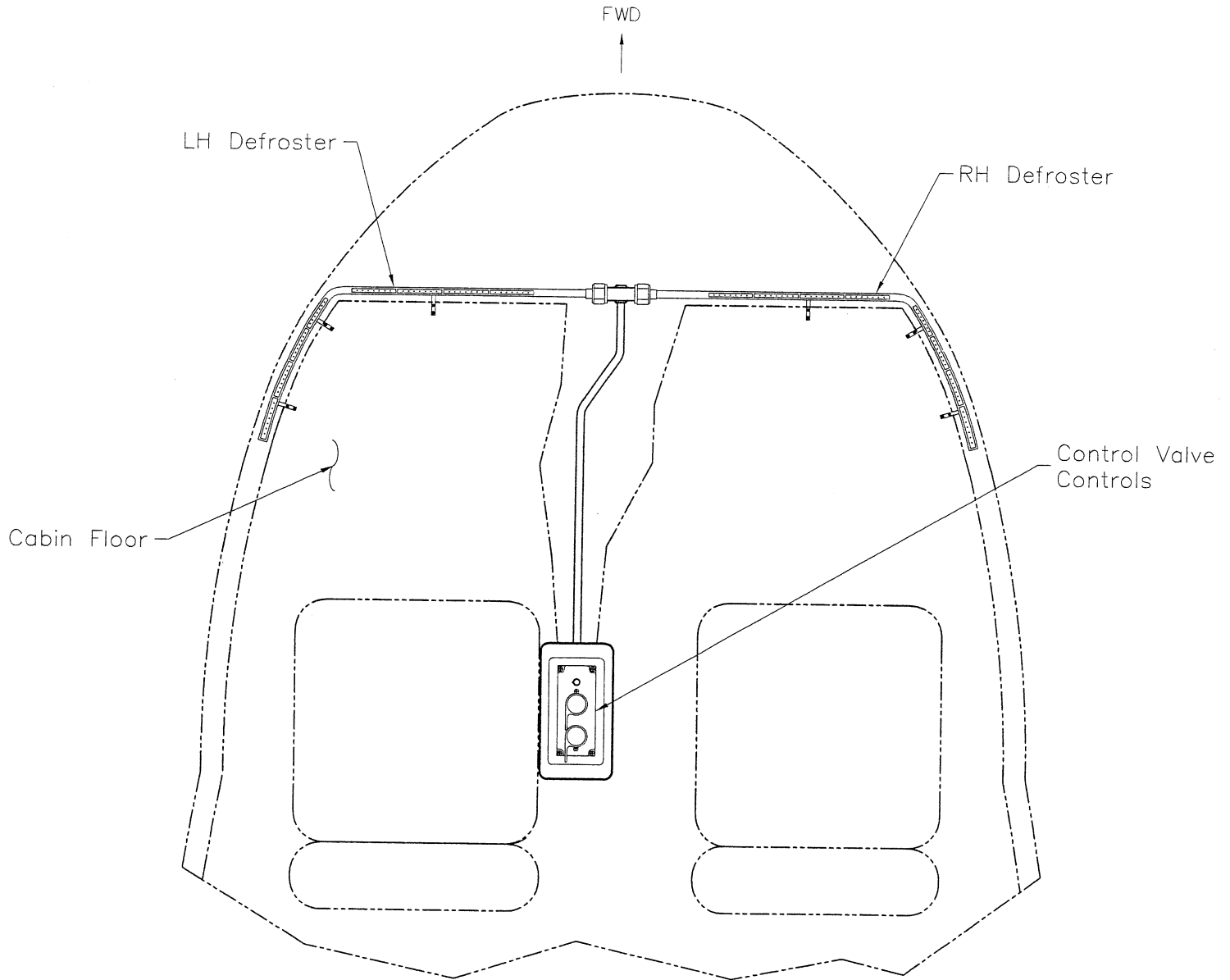
Chapter 3
LOCATION AND ACCESS (continued)



VIEW LOOKING Aft

Fig. 3.5 Aft Heater Ejector

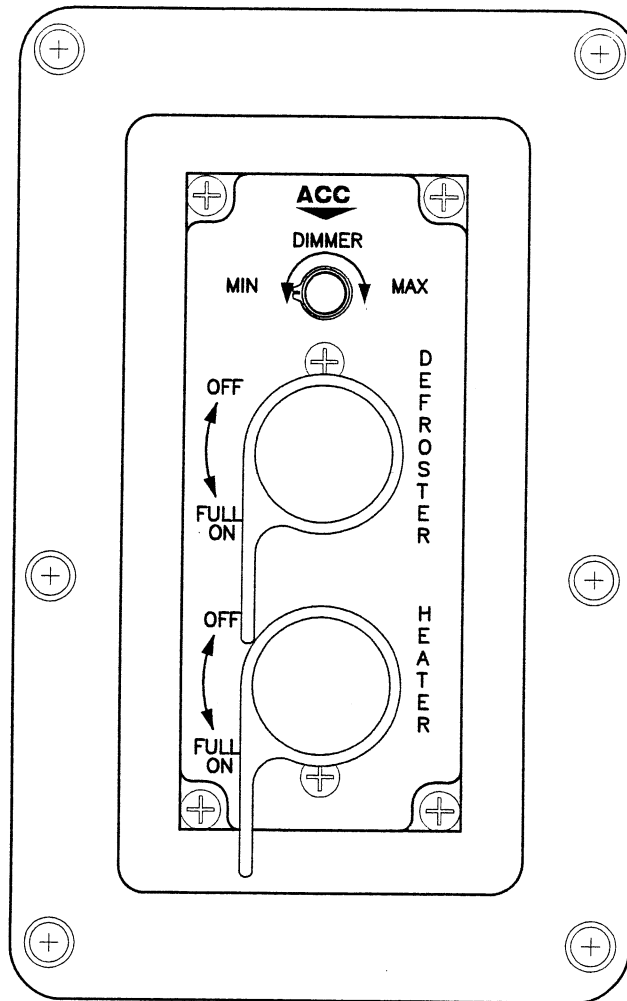
Chapter 3
LOCATION AND ACCESS (continued)



VIEW LOOKING DOWN
Fig. 3.6 Defroster Vanes

**CHAPTER 4
PLACARDS AND MARKINGS**

1. PLACARD AND MARKING INFORMATION



HEATER CONTROL PANEL MARKINGS LOOKING DOWN

**CHAPTER 5
SERVICING**

1. SAFETY PRECAUTIONS
Insure heater lines, and components are cool prior to attempting any work on these parts.
2. SERVICING INFORMATION
Not applicable to this installation.
3. LUBRICATION INFORMATION
Not applicable to this installation.
4. CONSUMABLE MATERIALS
Not applicable to this installation.
5. SUGGESTED SPARES LIST
Not applicable to this installation.

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CHAPTER 6 STANDARD PRACTICES INFORMATION

1. FITTING TORQUING PROCEDURES AND TORQUE VALUES

- # 6 Fittings: 30 – 35 in/lbs. (3.4-4.0 Nm)
- # 8 Fittings: 40 – 45 in/lbs. (4.6-5.1 Nm) DO NOT OVER TORQUE!
- #10 Fittings: 50 – 55 in/lbs. (5.7-6.3 Nm)

ALWAYS USE BACK UP WRENCH

1. B-NUT / FITTING SAFETY WIRE PROCEDURE

- A. Use MS20995C-32 per QQ-W-423B Condition A Safety wire (or Equivalent) to secure all B-nut / Fittings in the heater bleed air system.
 - a. Cut safety wire with excess length.
 - b. Thread through safety wire hole in B-nut (or fitting).
 - c. Pull ends even. Twist tight to B-nut (or fitting).
 - d. Twist wire to achieve 8 to 12 twist per inch (2.5 cm)
 - e. Thread through safety wire hole in B-nut (or fitting).
 - f. Twist wire again to achieve 8 to 12 twist per inch (2.5 cm), and cut to form "pigtail" of a minimum of 4 twist. Cut away excess.

2. REMOVAL, INSTALLATION / REPLACEMENT OF COCKPIT HEATER EJECTOR

REMOVAL

- A. Remove Safety form Ejector B-Nut.
- B. Disconnect the Ejector B-Nut from the inlet tube.
- C. Slide the Ejector forward in the S-9704EC-1 Adapter sufficiently to allow the Ejector to be removed from forward facing end of the Adapter assembly.
- D. Remove Ejector from the aircraft.

INSTALLATION / REPLACEMENT

- A. Install the Ejector Assembly in the reverse order of its removal.

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Chapter 6
STANDARD PRACTICES INFORMATION
(continued)

3. REMOVAL INSTALLATION / REPLACEMENT OF CABIN HEATER ASSEMBLY

REMOVAL

- A. Remove Access Panel from inside baggage compartment to gain access to Aft Heater Ejector.
- B. Disconnect the B-Nut from the inlet tube.
- C. Remove the Heater Assembly inlet & outlet attaching screws. Remove screws from upper inlet duct inside the cabin, and remove the Ejector assembly from the aircraft.

INSTALLATION / REPLACEMENT

- A. Install the Heater Assembly in the reverse order of its removal.

4. REMOVAL INSTALLATION/REPLACEMENT OF THE HEATER CONTROL VALVE

REMOVAL

- A. Remove the panel located under the Pilot and Co-pilots seats to gain access to the heater control valve assembly.
- B. Disconnect the bleed air plumbing from Control Valve.
- C. Remove the six attaching screws from the top side of the Control Valve Mounting bracket.
- D. Gently pull the Heater Valve assembly down to release the Heater Control Rods from the quick disconnect sockets, and remove valve from the aircraft.

NOTE

Mark the orientation of the heater control rods to the valve body prior to removal of the valve from the aircraft. This will aid in the reinstallation process of this part.

INSTALLATION / REPLACEMENT

- A. Install the Valve in the reverse order of its removal.

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Chapter 6
STANDARD PRACTICES INFORMATION
(continued)

5. REMOVAL INSTALLATION / REPLACEMENT OF THE BLEED AIR PLUMBING

REMOVAL

- A. Cut attaching safety wire from B-nuts at each end of the section of Bleed Air Plumbing to be removed.

NOTE

Always use a back-up wrench to hold the union, bulkhead fitting, or component that the Bleed Air Plumbing is being removed from.

- B. Loosen the B-Nut at each end of the Bleed Air Plumbing to be removed.
- C. Remove any clamps securing the Bleed Air Plumbing to the aircraft.
- D. Remove Bleed Air Plumbing from the aircraft.

INSTALLATION / REPLACEMENT

- A. Install Bleed Air Plumbing in the reverse order of its removal.

NOTE

Always use a back-up wrench to hold the union, bulkhead fitting, or component that the Bleed Air Plumbing is being installed.

- B. Torque B-Nuts per MS21344, and Safety wire per B-Nut / Fitting Safety Wire Procedure (See item 1, page 6-1).
- C. After completion of Bleed Air Plumbing installation, check all joints for audible signs of leakage during operational run up of system. Apply Torque Seal to all fittings.

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Chapter 6
STANDARD PRACTICES INFORMATION
(continued)

6. REMOVAL, INSTALLATION / REPLACEMENT OF WINDSHEILD DEFROSTER VANES

REMOVAL

- E. Remove Safety form Ejector B-Nut.
- F. Disconnect the Ejector B-Nut from the inlet tube.
- G. Lift carpet forward of the tail rotor control pedals, and remove defroster vane mounting screws (3 Places).
- H. Remove Defroster Vane from the aircraft.

INSTALLATION / REPLACEMENT

- A. Install the Defroster Vane Assembly in the reverse order of its removal.

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CHAPTER 7 TROUBLESHOOTING

1. SYSTEM TROUBLESHOOTING

Prior to troubleshooting a defective system, it is advisable to conduct a visual inspection for general condition, and obvious signs of damage or failure.

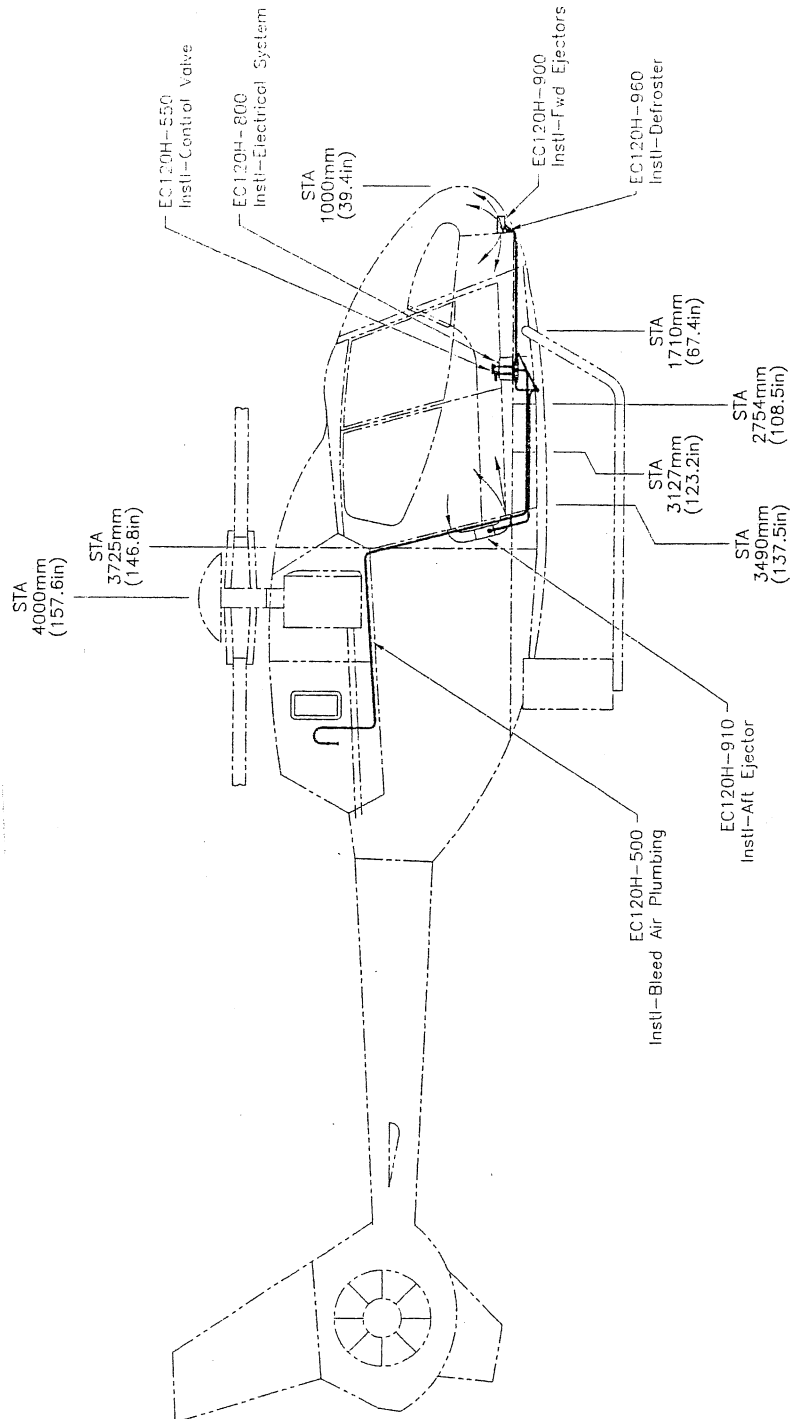
The following matrix lists the easiest checks, and the most likely problems.

| Problem | Probable Cause | Solution |
|--------------|--|--|
| No Heat | Manual heater valve in the off position | Operate the heater valve to the ON position |
| No Defroster | Manual Defroster valve in the off position | Operate the Defroster valve to the ON position |

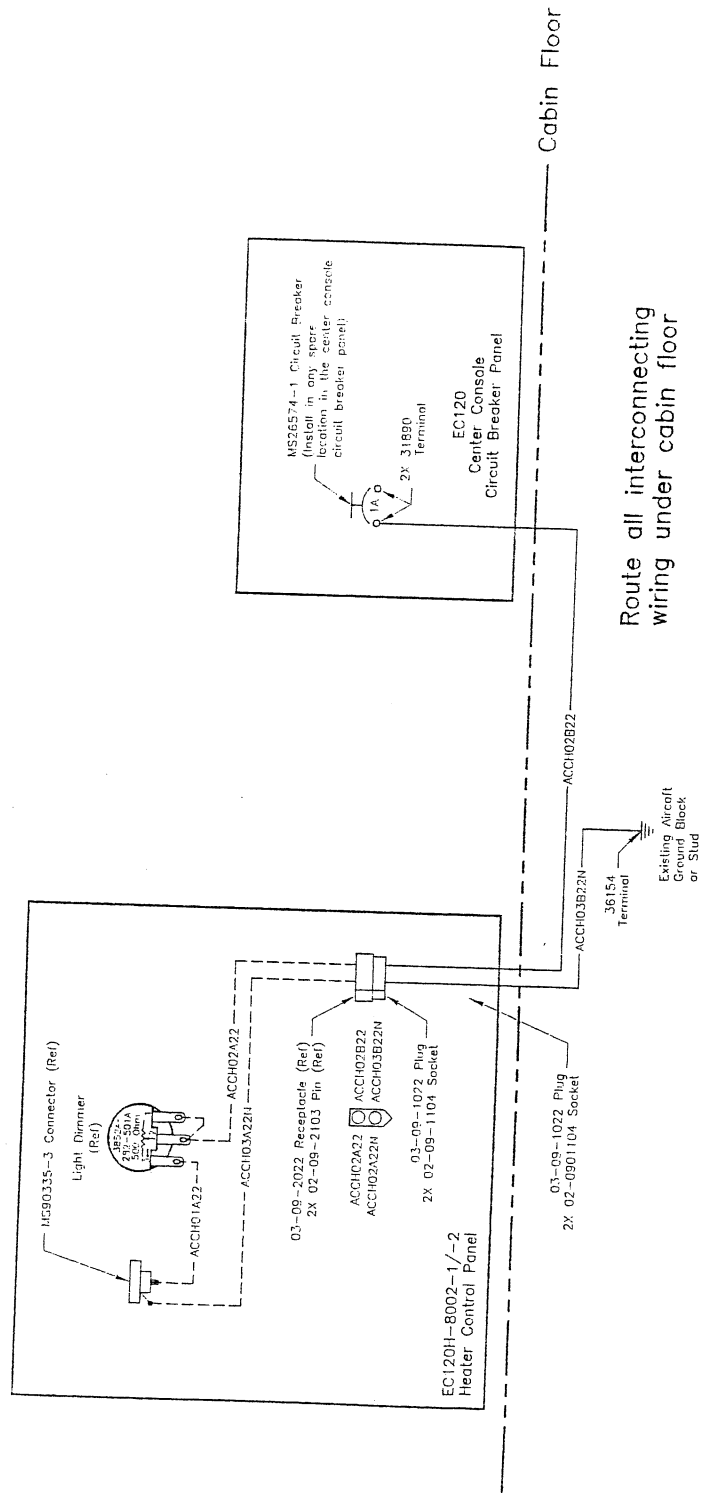
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Chapter 7
TROUBLESHOOTING (continued)

Figure 7-1 General Arrangement – Heater System Installation.



Chapter 7
TROUBLESHOOTING (continued)
Electrical Schematic



APPENDIX A

Weight and Balance Information

Weight breakdown – Eurocopter EC120B Heater System:
Ref. Dwg. EC120H-200

| Item | Wt. (lbs) | X-Arm (in) | X-M (in-lb.) | Y-Arm (in) | Y-M (in-lb) |
|--------------------------------------|------------------|-------------------|---------------------|-------------------|--------------------|
| EC120H-200 Heater / Defroster System | 12.50 | 112.0 | 1400 | 7.8 | 97 |

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